PATENT COOPERATION TREATY

From the
INTERNATIONAL PRELIMINARY EXAMINING AUTHORITY

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PCT

NOTIFICATION OF TRANSMITTAL OF INTERNATIONAL PRELIMINARY EXAMINATION REPORT

(PCT Rule 71.1)

Date of Mailing *(day/month/year)*	13 SEP 2004

Applicant's or agent's file reference	**IMPORTANT NOTIFICATION**
100788.0010P	

International application No.	International filing date *(day/month/year)*	Priority date *(day/month/year)*
PCT/US03/17073	28 May 2003 (28.05.2003)	28 May 2002 (28.05.2002)

Applicant

AUTOGENOMICS,INC.

1. The applicant is hereby notified that this International Preliminary Examining Authority transmits herewith the international preliminary examination report and its annexes, if any, established on the international application.

2. A copy of the report and its annexes, if any, is being transmitted to the International Bureau for communication to all the elected Offices.

3. Where required by any of the elected Offices, the International Bureau will prepare an English translation of the report (but not of any annexes) and will transmit such translation to those Offices.

4. **REMINDER**

The applicant must enter the national phase before each elected Office by performing certain acts (filing translations and paying national fees) within 30 months from the priority date (or later in some Offices)(Article 39(1))(see also the reminder sent by the International Bureau with Form PCT/IB/301).

Where a translation of the international application must be furnished to an elected Office, that translation must contain a translation of any annexes to the international preliminary examination report. It is the applicant's responsibility to prepare and furnish such translation directly to each elected Office concerned.

For further details on the applicable time limits and requirements of the elected Offices, see Volume II of the PCT Applicant's Guide.

Name and mailing address of the IPEA/US	Authorized officer
Mail Stop PCT, Attn: IPEA/US Commissioner for Patents P.O. Box 1450 Alexandria, Virginia 22313-1450	MY-CHAU T TRAN
Facsimile No. (703) 872-9306	Telephone No. 571-272-1600

Form PCT/IPEA/416 (July 1992)

PATENT COOPERATION TREATY

PCT

INTERNATIONAL PRELIMINARY EXAMINATION REPORT

(PCT Article 36 and Rule 70)

Applicant's or agent's file reference 100788.0010P	**FOR FURTHER ACTION**	See Notification of Transmittal of International Preliminary Examination Report (Form PCT/IPEA/416)
International application No. PCT/US03/17073	International filing date *(day/month/year)* 28 May 2003 (28.05.2003)	Priority date *(day/month/year)* 28 May 2002 (28.05.2002)
International Patent Classification (IPC) or national classification and IPC IPC(7): G01N 15/06, 33/53, 33/543, 33/553; C12Q 1/68 and US Cl.: 435/6, 7.1, 7.2, 7.9, 91.1, 287.1, 288.4; 436/518, 164, 171		
Applicant AUTOGENOMICS,INC.		

1. This international preliminary examination report has been prepared by this International Preliminary Examining Authority and is transmitted to the applicant according to Article 36.

2. This REPORT consists of a total of 3 sheets, including this cover sheet.

   ☒ This report is also accompanied by ANNEXES, i.e., sheets of the description, claims and/or drawings which have been amended and are the basis for this report and/or sheets containing rectifications made before this Authority (see Rule 70.16 and Section 607 of the Administrative Instructions under the PCT).

   These annexes consist of a total of 3 sheets.

3. This report contains indications relating to the following items:

   - I ☒ Basis of the report
   - II ☐ Priority
   - III ☐ Non-establishment of report with regard to novelty, inventive step and industrial applicability
   - IV ☐ Lack of unity of invention
   - V ☒ Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement
   - VI ☐ Certain documents cited
   - VII ☐ Certain defects in the international application
   - VIII ☐ Certain observations on the international application

Date of submission of the demand 18 December 2003 (18.12.2003)	Date of completion of this report 02 September 2004 (02.09.2004)
Name and mailing address of the IPEA/US Mail Stop PCT, Attn: IPEA/US Commissioner for Patents P.O. Box 1450 Alexandria, Virginia 22313-1450 Facsimile No. (703) 872-9306	Authorized officer Valerie Bell-Harris for MY-CHAU T TRAN Telephone No. 571-272-1600

Form PCT/IPEA/409 (cover sheet)(July 1998)

INTERNATIONAL PRELIMINARY EXAMINATION REPORT

International application No.
PCT/US03/17073

I. Basis of the report

1. With regard to the elements of the international application:*

☐ the international application as originally filed.

☒ the description:
pages 1-20 as originally filed
pages NONE, filed with the demand
pages NONE, filed with the letter of _____.

☒ the claims:
pages NONE, as originally filed
pages NONE, as amended (together with any statement) under Article 19
pages NONE, filed with the demand
pages 21-23, filed with the letter of 27 July 2004.

☒ the drawings:
pages 1-3, as originally filed
pages NONE, filed with the demand
pages NONE, filed with the letter of _____.

☐ the sequence listing part of the description:
pages NONE, as originally filed
pages NONE, filed with the demand
pages NONE, filed with the letter of _____.

2. With regard to the **language**, all the elements marked above were available or furnished to this Authority in the language in which the international application was filed, unless otherwise indicated under this item.
These elements were available or furnished to this Authority in the following language _____ which is:

☐ the language of a translation furnished for the purposes of international search (under Rule23.1(b)).

☐ the language of publication of the international application (under Rule 48.3(b)).

☐ the language of the translation furnished for the purposes of international preliminary examination(under Rules 55.2 and/or 55.3).

3. With regard to any **nucleotide and/or amino acid sequence** disclosed in the international application, the international preliminary examination was carried out on the basis of the sequence listing:

☐ contained in the international application in printed form.

☐ filed together with the international application in computer readable form.

☐ furnished subsequently to this Authority in written form.

☐ furnished subsequently to this Authority in computer readable form.

☐ The statement that the subsequently furnished written sequence listing does not go beyond the disclosure in the international application as filed has been furnished.

☐ The statement that the information recorded in computer readable form is identical to the written sequence listing has been furnished.

4. ☐ The amendments have resulted in the cancellation of:

☐ the description, pages NONE

☐ the claims, Nos. NONE

☐ the drawings, sheets/~~fig~~ NONE

5. ☐ This report has been established as if (some of) the amendments had not been made, since they have been considered to go beyond the disclosure as filed, as indicated in the Supplemental Box (Rule 70.2(c)).**

** Replacement sheets which have been furnished to the receiving Office in response to an invitation under Article 14 are referred to in this report as "originally filed" and are not annexed to this report since they do not contain amendments (Rules 70.16 and 70.17).*

*** Any replacement sheet containing such amendments must be referred to under item 1 and annexed to this report.*

INTERNATIONAL PRELIMINARY EXAMINATION REPORT

International application No.
PCT/US03/17073

V. Reasoned statement under Rule 66.2(a)(ii) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

1. STATEMENT

Novelty (N)	Claims 1-20	YES
	Claims NONE	NO
Inventive Step (IS)	Claims NONE	YES
	Claims 1-20	NO
Industrial Applicability (IA)	Claims 1-20	YES
	Claims NONE	NO

2. CITATIONS AND EXPLANATIONS

Claims 1-20 lack an inventive step under PCT Article 33(3) as being obvious over Balch et al. (US Patent 6,331,441 B1). Balch et al. disclose a method and apparatus for the quantitative analysis of molecules (col. 7, lines 1-6). The apparatus comprises an array, and a detection system (col. 11, lines 18-44). The array comprises biosites wherein the binding of the targets to the probes occurs (col. 11, lines 6-10, and 25-34). The detection system comprises a proximal charge-coupled device for detection/imaging of the array and a dynamic platform that move the array relative to the detection/imaging device (col. 27, line 25 to col. 28, line 67). Although the apparatus of Balch et al. does not expressly include two light source wherein the first light source is for generating a registration marker signal and the second light source for generating an analyte signal, it would have been obvious to a person of ordinary skill in the art at the time the invention was made to include two light sources wherein the first light source is for generating a registration marker signal and the second light source for generating an analyte signal in the apparatus of Balch et al. because number of light source would be a choice of experimental design and is considered within the purview of the cited prior art.

Claims 1-20 meet the criteria set out in PCT Article 33(2), because the prior art does not teach or fairly suggest an analytic system comprising two light sources wherein the first light source is for generating a registration marker signal and the second light source for generating an analyte signal.

Claims 1-20 meet the criteria set out in PCT Article 33(4), and thus the presently claimed system has industrial applicability because the subject matter claimed can be made or used in industry.

Applicant amendment to Claims 1, 14, and 18 filed 7/27/2004 is acknowledged, but it is not considered since the amendment was filed after the international preliminary examination report was sent to applicant, i.e. to the written opinion was mailed on 7/1/2004. Applicant response filed 7/27/2004 to the written opinion mailed 7/1/2004 is acknowledged and entered. Applicant alleges that 1) the presently amended claims 1-20 is not obvious over the cited reference of Balch et al.; 2) applicant argument include US case law, i.e. Zurko, 258 F.3d at 1385, 59 USPQ2d at 1697; and 3) Balch's system is devoid of any need, suggestion, or motivation to determine a focal plane. It is the examiner position that 1) the presently amended claims 1-20 are not considered since the amendment was filed after the international preliminary examination report was sent to applicant and thus, applicant argument with regard to the amended claims 1-20 is moot. 2) The use of US case law for applicant argument is improper since this is a PCT application not a US application. 3) Balch et does suggest a system to determine a focal plane (col. 6, lines 53-60). Therefore, the presently claimed inventions lack an inventive step under PCT Article 33(3) over the cited reference of Balch et al.

---------- NEW CITATIONS ----------

CLAIMS

What is claimed is:

1. An analytic system for optical detection of a plurality of analytes that are bound to a biochip, comprising:

a platform coupled to a confocal microscope detector and movable along an x-coordinate, a y-coordinate, and optionally a z-coordinate relative to the detector, wherein the platform is configured to receive a biochip;

wherein the biochip has a registration marker and further has a plurality of analytes in predetermined positions relative to the registration marker;

a first light source that illuminates the registration marker to generate a registration marker signal, and a second light source that illuminates at least one of the plurality of analytes to generate an analyte signal; and

wherein a focal position for detection of the analyte signal by the detector is determined by the analytic system using the registration marker signal.

2. The analytic system of claim 1 wherein the detector comprises an objective lens or an objective lens system with a numeric aperture that is sufficient to allow detection of the analyte signal without moving the platform along the z-coordinate.

3. The analytic system of claim 1 wherein the first light source has a wavelength maximum that is different from an absorption maximum of an optically detectable label of the at least one of the plurality of analytes.

4. The analytic system of claim 1 further comprising a third light source that illuminates the at least one of the plurality of analytes or another one of the plurality of analytes to generate a second analyte signal, and wherein the third light source has a wavelength maximum that is different from both, the wavelength maximum of the first light source and the absorption maximum of an optically detectable label of the at least one of the plurality of analytes or another one of the plurality of analytes.

5. The analytic system of claim 1 wherein the registration marker and the at least one of the analytes are illuminated at a different angle by the first and the second light source, respectively.

6. The analytic system of claim 1 wherein the first light source is a laser or a light emitting diode, and wherein the second light source is a laser.

7. The analytic system of claim 1 wherein the registration marker comprises a fluorescent dye, a luminescent compound, a phosphorescent compound, or a reflective compound.

8. The analytic system of claim 1 wherein the analyte signal is a fluorescence signal, a chemiluminescence signal, or a phosphorescence signal.

9. The analytic system of claim 1 wherein the detector comprises a photo-multiplier tube or a charge-coupled device.

10. The analytic system of claim 1 further comprising a second and a third registration marker, and wherein the focal position for detection of the analyte signal by the detector is determined by the analytic system using registration marker signals from the registration marker, the second registration marker and the third registration marker.

11. The analytic system of claim 1 wherein the analyte signal is normalized by the analytic system using a positive control marker on the biochip.

12. The analytic system of claim 1 further comprising a data transfer interface electronically coupled to the detector.

13. The analytic system of claim 12 wherein the data transfer interface provides data to a computer in a remote location.

14. An analytic system for micro-optical analysis of a biochip having a first light source and a second light source, wherein the first light source illuminates a registration marker on the biochip to provide a registration marker signal, wherein the second light source illuminates an analyte to provide an analyte signal, and

wherein a focal position for detection of the analyte signal with a confocal microscope is determined using the registration marker signal.

15. The analytic system of claim 14 wherein the analyte signal has a round shape with a diameter of no more than 500 micrometer.

16. The analytic system of claim 15 wherein a test result is calculated from an average signal value of a portion of the round shape.

17. The analytic system of claim 14 further comprising a third light source illuminating the analyte to generate a second analyte signal.

18. An analytic system for optical analysis of a biochip comprising a first optical subsystem that uses a first light source that illuminates a registration marker on the biochip, and a first detector that detects a registration marker signal, the system further comprising a second optical subsystem that uses a second light source that illuminates a probe or analyte on the biochip, and a second detector that detects a probe or analyte signal, wherein the first subsystem is used to determine a focal position for detection of the probe or analyte signal using the registration marker signal, and wherein the second subsystem is used to quantify the probe or analyte signal.

19. The analytic system of claim 18 wherein a platform receives the biochip, and wherein the biochip is moved into the focal position by moving the platform along an x-coordinate and a y-coordinate.

20. The analytic system of claim 19 wherein the biochip is moved into the focal position without moving the biochip along an z-coordinate.